CLAIMS

WHAT IS CLAIMED IS:

1. A system for forming a microporous ink receptive coating comprising:

a fusible latex configured to coat a substrate, wherein said fusible latex includes a hard core material and a soft shell material;

wherein said latex exhibits self-adhesive properties at a system operation temperature.

2. The system of claim 1, wherein said latex is configured to form an ink permeable microporous layer when coated on said substrate.

3. The system of claim 2, wherein said latex is configured to be fused into a continuous transparent film by the application of thermal energy or pressure.

4. The system of claim 3, wherein said hard core material exhibits a glass transition temperature above 80 degrees Celsius and said soft shell material exhibits a glass transition temperature below 70 degrees Celsius.

5. The system of claim 4, wherein said hard core material comprises one of poly(methylmethacrylate), poly(styrene), poly(tert-butylstyrene), poly(p-methylstyrene), poly(t-butylacrylamide), poly(styrene-co-methylmethacrylate), poly(styrene-co-t-butylacrylamide), poly(methylmethacrylate-co-t-butylacrylamide), or homopolymers derived from tert-butyl methacrylate, p-cyanophenyl methacrylate, pentachlorophenyl acrylate, methacrylonitrile, isobornyl methacrylate, phenyl methacrylate, acrylonitrile, isobornyl acrylate, p-cyanophenyl acrylate, 2-chloroethyl acrylate, 2-chloroethyl methacrylate, 2-naphthyl acrylate, n-isopropyl acrylamide, 1-fluoromethyl methacrylate, isopropyl methacrylate, or 2-hydroxypropyl methacrylate.

6. The system of claim 4, wherein said soft shell material comprises one of a homo- or copolymer derived from n-butyl acrylate, n-ethylacrylate, 2-ethylhexylacrylate, methoxyethylacrylate, methoxyethoxy-ethylacrylate, ethoxyethylacrylate, ethoxyethoxyethylacrylate, 2-ethylhexyl-methacrylate, n-propylacrylate, hydroxyethylacrylate, tetrahydrofufuryl acrylate, cyclohexylacrylate, iso-decylacrylate, n-decylmethacrylate, n-propylacrylate, vinylacetate, 2-(N,N-Dimethylamino)ethyl methacrylate, 2-N-Morpholinoethyl acrylate, or 3-Dimethylaminoneopentyl acrylate.

7. The system of claim 4, wherein said soft shell material comprises a cationic monomer or a salt of a cationic monomer.

8. The system of claim 7, wherein said soft shell material comprises one of poly(n-butyl acrylate co-trimethylammoniumethyl acrylate), poly(2-ethylhexyl acrylate co-trimethylammoniumethyl acrylate) poly(methoxyethylacrylate co-trimethylammoniumethyl acrylate), poly(ethoxy-ethylacrylate co-trimethylammoniumethyl acrylate), poly(n-butylacrylate-co-trimethylammoniumethyl acrylate), poly(n-butylacrylate-co-trimethylammoniumethyl methacrylate), poly(n-butylacrylate-co-vinylbenzyltrimethylammonium chloride), poly (n-ethylhexylacrylate-co-2-hydroxyethylacrylate co-trimethylammoniumethyl acrylate), poly (n-butylacrylate-co-2-hydroxyethylacrylate co-trimethylammoniumethyl acrylate), poly(n-ethylhexylacrylate -co- vinylbenzyltrimethylammonium chloride), poly(n-methoxyethylacrylate -co- vinylbenzyltrimethylammonium chloride), or poly(n-ethoxyethylacrylate -co-vinylbenzyltrimethylammonium chloride).

9. The system of claim 4, wherein said latex further comprises a coalescing agent.

10. The system of claim 9, wherein said coalescing agent comprises one of ethylene glycol, propylene glycol, hexylene glycol, ester of ethylene

glycol, propylene glycol, hexylene glycol, 2-butoxyethanol, 2,2,4-trimethylpentane diol monoisobutyrate, diisobutyl esters of a mixture of diacids, Rhodiasolve DIB (by Rhodia Chemical), butyl cellulose, 2-(2-butoxyethoxy)ethanol, 2-butoxyethanol, TEXANOL (Eastman Chemical), diisobutyl succinate, diisobutyl glutarate, diisobutyl adipate, SER-AD FX-510 (Sasol Chemical), or SER-AD FX-511 (Sasol Chemical).

11. The system of claim 1, wherein said substrate comprises:
a base including a paper or photobase material; and
a microporous substrate formed on said base.

12. The system of claim 11, wherein said microporous substrate is deposited with a density of 10 to 50 grams per square meter and said fusible latex is deposited with a density of 0.1 to 10 grams per square meter.

13. The system of claim 1, wherein said substrate comprises a previously deposited layer of microporous material including one of an inorganic metal oxide, a calcium carbonate, or a polymeric membrane and plastic pigment.

14. The system of claim 1, further comprising a coating applicator.

15. The system of claim 14, wherein said coating applicator comprises one of a slot applicator, a roll applicator, a cascade applicator, a slide applicator, a blade applicator, or an inkjet dispenser.

16. The system of claim 1, further comprising a thermal applicator configured to supply sufficient thermal energy to heat said fusible latex above a glass transition temperature of said soft shell material.

17. The system of claim 16, wherein said thermal applicator further comprises a heated roller.

18. The system of claim 17, wherein said heated roller is further configured to supply pressure to said fusible latex.

19. The system of claim 4, further comprising a computing device communicatively coupled to said system;

wherein said computing device is configured to control the formation of said microporous ink receptive coating.

20. The system of claim 4, further comprising an ink dispenser configured to form an image on said substrate.

21. The system of claim 20, wherein said inkjet dispenser comprises one of a thermally actuated inkjet dispenser, a mechanically actuated inkjet dispenser, an electrostatically actuated inkjet dispenser, a magnetically actuated dispenser, a piezoelectrically actuated dispenser, or a continuous inkjet dispenser.

22. The system of claim 1, further comprising an adhesion enhancer.

23. The system of claim 22, wherein said adhesion enhancer comprises one of a water-soluble polymer or a non-core shell latex having a glass transition temperature less than 30°C.

24. The system of claim 1, wherein said fusible latex comprises a plurality of particles, said particles being smaller than 200 nanometers in diameter.

25. The system of claim 24, wherein said fusible latex particles comprise a diameter of less than 150 nanometers in diameter.

26. A method for forming a microporous ink receptive coating comprising:
depositing a fusible latex on a substrate, wherein said fusible latex includes a hard core material and a soft shell material;

wherein said latex exhibits self-adhesive properties at a system operation temperature.

27. The method of claim 26, wherein said fusible latex is deposited on said substrate having a density of 0.1 to 10 grams per square meter.

28. The method of claim 27, wherein said latex is configured to be fused into a continuous transparent film by the application of thermal energy or pressure.

29. The method of claim 28, wherein said hard core material exhibits a glass transition temperature above 80 degrees Celsius and said soft shell material exhibits a glass transition temperature below 70 degrees Celsius.

30. The method of claim 29, wherein said hard core material comprises one of poly(methylmethacrylate), poly(styrene), poly(p-methylstyrene), poly(t-butylacrylamide), poly(styrene-co-methylmethacrylate), poly(styrene-co-t-butylacrylamide), poly(methylmethacrylate-co-t-butylacrylamide), or homopolymers derived from p-cyanophenyl methacrylate, pentachlorophenyl acrylate, methacrylonitrile, isobornyl methacrylate, phenyl methacrylate, acrylonitrile, isobornyl acrylate, p-cyanophenyl acrylate, 2-chloroethyl acrylate, 2-chloroethyl methacrylate, 2-naphthyl acrylate, n-isopropyl acrylamide, 1-fluoromethyl methacrylate, isopropyl methacrylate, or 2-hydroxypropyl methacrylate.

31. The method of claim 29, wherein said soft shell material comprises one of a homo- or copolymer derived from n-butyl acrylate, n-ethylacrylate, 2-ethylhexylacrylate, methoxyethylacrylate, methoxyethoxy-

ethylacrylate, ethoxyethylacrylate, ethoxyethoxyethylacrylate, 2-ethylhexyl-methacrylate, n-propylacrylate, hydroxyethylacrylate, tetrahydrofufuryl acrylate, cyclohexylacrylate, iso-decylacrylate, n-decylmethacrylate, n-propylacrylate, vinylacetate, 2-(N,N-Dimethylamino)ethyl methacrylate, 2-N-Morpholinoethyl acrylate, or 3-Dimethylaminoneopentyl acrylate.

32. The method of claim 29, wherein said soft shell material comprises a cationic monomer or a salt of a cationic monomer.

33. The method of claim 32, wherein said soft shell material comprises one of poly(n-butyl acrylate co-trimethylammoniumethyl acrylate), poly(2-ethylhexyl acrylate co-trimethylammoniumethyl acrylate) poly(methoxyethylacrylate co-trimethylammoniumethyl acrylate), poly(ethoxy-ethylacrylate co-trimethylammoniumethyl acrylate), poly(n-butylacrylate-co-trimethylammoniumethyl acrylate), poly(n-butylacrylate-co-trimethylammoniumethyl methacrylate), poly(n-butylacrylate-co-vinylbenzyltrimethylammonium chloride), poly (n-ethylhexylacrylate-co-2-hydroxyethylacrylate co-trimethylammoniumethyl acrylate), poly (n-butylacrylate-co-2-hydroxyethylacrylate co-trimethylammoniumethyl acrylate), poly(n-ethylhexylacrylate -co- vinylbenzyltrimethylammonium chloride), poly(n-methoxyethylacrylate -co- vinylbenzyltrimethylammonium chloride), or poly(n-ethoxyethylacrylate -co-vinylbenzyltrimethylammonium chloride).

34. The method of claim 29, wherein said latex further comprises a coalescing agent.

35. The method of claim 34, wherein said coalescing agent comprises one of ethylene glycol, propylene glycol, hexylene glycol, ester of ethylene glycol, propylene glycol, hexylene glycol, 2-butoxyethanol, 2,2,4-trimethylpentane diol monoisobutyrate, diisobutyl esters of a mixture of diacids, Rhodiasolve DIB (by Rhodia Chemical), butyl cellulose, 2-(2-butoxyethoxy)ethanol, 2-butoxyethanol, TEXANOL (Eastman Chemical),

diisobutyl succinate, diisobutyl glutarate, diisobutyl adipate, SER-AD FX-510 (Sasol Chemical), or SER-AD FX-511 (Sasol Chemical)

36. The method of claim 27, further comprising:

selectively jetting an ink onto said fusible latex, thereby forming a desired image; and

fusing a top portion of said fusible latex.

37. The method of claim 36, wherein said ink is jetted into said fusible latex by one of a thermally actuated inkjet dispenser, a mechanically actuated inkjet dispenser, an electrostatically actuated inkjet dispenser, a magnetically actuated dispenser, a piezoelectrically actuated dispenser, or a continuous inkjet dispenser.

38. The method of claim 36, wherein said fusing comprises applying sufficient thermal energy to heat said latex above a glass transition temperature of said soft shell material.

39. The method of claim 38, wherein said thermal energy is provided by a thermal roller.

40. The method of claim 39, wherein said thermal roller is further configured to provide pressure to said latex.

41. The method of claim 36, further comprising automating said method.

42. A means for forming a microporous ink receptive coating comprising:

a binderless means for coating a substrate, wherein said binderless means includes a hard core material and a soft shell material;

wherein said binderless means exhibits self-adhesive properties at a system operation temperature.

43. The means for forming a microporous ink receptive coating of claim 42, wherein said binderless means forms an ink permeable microporous layer when coated on said substrate.

44. The means for forming a microporous ink receptive coating of claim 42, wherein said binderless means is configured to be fused into a continuous transparent film by the application of thermal energy or pressure.

45. The means for forming a microporous ink receptive coating of claim 42, wherein said hard core material exhibits a glass transition temperature above 80 degrees Celsius and said soft shell material exhibits a glass transition temperature below 70 degrees Celsius.

46. The means for forming a microporous ink receptive coating of claim 42, further comprising a means for applying thermal energy to said binderless means.

47. The means for forming a microporous ink receptive coating of claim 46, further comprising means for applying pressure to said binderless means.

48. A microporous coating comprising:

a fusible latex, wherein said fusible latex includes a hard core material and a soft shell material;

wherein said latex exhibits self-adhesive properties at a room temperature.

49. The microporous coating of claim 48, wherein said latex is configured to form an ink permeable microporous layer when coated on a substrate.

50. The microporous coating of claim 49, wherein said ink permeable microporous layer is configured to be coated having a density of 0.1 to 10 grams per square meter onto said substrate.

51. The microporous coating of claim 50, wherein said latex is configured to be fused into a continuous transparent film by the application of thermal energy or pressure.

52. The microporous coating of claim 51, wherein said hard core material exhibits a glass transition temperature above 80 degrees Celsius and said soft shell material exhibits a glass transition temperature below 70 degrees Celsius.

53. The microporous coating of claim 52, wherein said hard core material comprises one of poly(methylmethacrylate), poly(styrene), poly(p-methylstyrene), poly(t-butylacrylamide), poly(styrene-co-methylmethacrylate), poly(styrene-co-t-butylacrylamide), poly(methylmethacrylate-co-t-butylacrylamide), or homopolymers derived from p-cyanophenyl methacrylate, pentachlorophenyl acrylate, methacrylonitrile, isobornyl methacrylate, phenyl methacrylate, acrylonitrile, isobornyl acrylate, p-cyanophenyl acrylate, 2-chloroethyl acrylate, 2-chloroethyl methacrylate, 2-naphthyl acrylate, n-isopropyl acrylamide, 1-fluoromethyl methacrylate, isopropyl methacrylate, or 2-hydroxypropyl methacrylate.

54. The microporous coating of claim 52, wherein said soft shell material comprises one of a homo- or copolymer derived from n-butyl acrylate, n-ethylacrylate, 2-ethylhexylacrylate, methoxyethylacrylate, methoxyethoxy-ethylacrylate, ethoxyethylacrylate, ethoxyethoxyethylacrylate, 2-ethylhexyl-

methacrylate, n-propylacrylate, hydroxyethylacrylate, tetrahydrofufuryl acrylate, cyclohexylacrylate, iso-decylacrylate, n-decylmethacrylate, n-propylacrylate, vinylacetate, 2-(N,N-Dimethylamino)ethyl methacrylate, 2-N-Morpholinoethyl acrylate, or 3-Dimethylaminoneopentyl acrylate.

55. The microporous coating of claim 52, wherein said soft shell material comprises a cationic monomer or a salt of a cationic monomer.

56. The microporous coating of claim 55, wherein said soft shell material comprises one of poly(n-butyl acrylate co-trimethylammoniumethyl acrylate), poly(2-ethylhexyl acrylate co-trimethylammoniumethyl acrylate) poly(methoxyethylacrylate co-trimethylammoniumethyl acrylate), poly(ethoxy-ethylacrylate co-trimethylammoniumethyl acrylate), poly(n-butylacrylate-co-trimethylammoniumethyl acrylate), poly(n-butylacrylate-co-trimethylammoniumethyl methacrylate), poly(n-butylacrylate-co-vinylbenzyltrimethylammonium chloride), poly (n-ethylhexylacrylate-co-2-hydroxyethylacrylate co-trimethylammoniumethyl acrylate), poly (n-butylacrylate-co-2-hydroxyethylacrylate co-trimethylammoniumethyl acrylate), poly(n-ethylhexylacrylate -co- vinylbenzyltrimethylammonium chloride), poly(n-methoxyethylacrylate -co- vinylbenzyltrimethylammonium chloride), or poly(n-ethoxyethylacrylate -co-vinylbenzyltrimethylammonium chloride).

57. The microporous coating of claim 49, wherein said latex further comprises a coalescing agent.

58. The microporous coating of claim 57, wherein said coalescing agent comprises one of ethylene glycol, propylene glycol, hexylene glycol, ester of ethylene glycol, propylene glycol, hexylene glycol, 2-butoxyethanol, 2,2,4-trimethylpentane diol monoisobutyrate, diisobutyl esters of a mixture of diacids, Rhodiasolve DIB (by Rhodia Chemical), butyl cellulose, 2-(2-butoxyethoxy)ethanol, 2-butoxyethanol, TEXANOL (Eastman Chemical),

diisobutyl succinate, diisobutyl glutarate, diisobutyl adipate, SER-AD FX-510 (Sasol Chemical), or SER-AD FX-511 (Sasol Chemical).

59. A sealable ink receptive substrate comprising:

an ink receiving layer; and

a microporous coating deposited on said ink receiving layer;

wherein said microporous substrate comprises a fusible latex, said fusible latex including a hard core material and a soft shell material, and exhibiting self-adhesive properties at a room temperature.

60. The sealable ink receptive substrate of claim 59, wherein said ink receiving layer comprises:

a base including a paper or photobase material; and

a microporous substrate disposed on said base.

61. The sealable ink receptive substrate of claim 59, wherein said ink receiving layer comprises a previously deposited layer of microporous latex.

62. The sealable ink receptive substrate of claim 59, wherein said fusible latex is configured to form an ink permeable microporous layer when coated on said substrate.

63. The sealable ink receptive substrate of claim 62, wherein said fusible latex is configured to be fused into a continuous transparent film by the application of thermal energy or pressure.

64. The sealable ink receptive substrate of claim 63, wherein said hard core material exhibits a glass transition temperature above 80 degrees Celsius and said soft shell material exhibits a glass transition temperature below 70 degrees Celsius.

65. The sealable ink receptive substrate of claim 64, wherein said hard core material comprises one of poly(methylmethacrylate), poly(styrene), poly(p-methylstyrene), poly(t-butylacrylamide), poly(styrene-co-methylmethacrylate), poly(styrene-co-t-butylacrylamide), poly(methylmethacrylate-co-t-butylacrylamide), or homopolymers derived from p-cyanophenyl methacrylate, pentachlorophenyl acrylate, methacrylonitrile, isobornyl methacrylate, phenyl methacrylate, acrylonitrile, isobornyl acrylate, p-cyanophenyl acrylate, 2-chloroethyl acrylate, 2-chloroethyl methacrylate, 2-naphthyl acrylate, n-isopropyl acrylamide, 1-fluoromethyl methacrylate, isopropyl methacrylate, or 2-hydroxypropyl methacrylate.

66. The sealable ink receptive substrate of claim 64, wherein said soft shell material comprises one of a homo- or copolymer derived from n-butyl acrylate, n-ethylacrylate, 2-ethylhexylacrylate, methoxyethylacrylate, methoxyethoxy-ethylacrylate, ethoxyethylacrylate, ethoxyethoxyethylacrylate, 2-ethylhexyl-methacrylate, n-propylacrylate, hydroxyethylacrylate, tetrahydrofufuryl acrylate, cyclohexylacrylate, iso-decylacrylate, n-decylmethacrylate, n-propylacrylate, vinylacetate, 2-(N,N-Dimethylamino)ethyl methacrylate, 2-N-Morpholinoethyl acrylate, or 3-Dimethylaminoneopentyl acrylate.

67. The sealable ink receptive substrate of claim 64, wherein said soft shell material comprises a cationic monomer or a salt of a cationic monomer.

68. The sealable ink receptive substrate of claim 67, wherein said soft shell material comprises one of poly(n-butyl acrylate co-trimethylammoniumethyl acrylate), poly(2-ethylhexyl acrylate co-trimethylammoniumethyl acrylate) poly(methoxyethylacrylate co-trimethylammoniumethyl acrylate), poly(ethoxy-ethylacrylate co-trimethylammoniumethyl acrylate), poly(n-butylacrylate-co-trimethylammoniumethyl acrylate), poly(n-butylacrylate-co-trimethylammoniumethyl methacrylate), poly(n-butylacrylate-co-

vinylbenzyltrimethylammonium chloride), poly (n-ethylhexylacrylate-co-2-hydroxyethylacrylate co-trimethylammoniumethyl acrylate), poly (n-butylacrylate-co-2-hydroxyethylacrylate co-trimethylammoniumethyl acrylate), poly(n-ethylhexylacrylate -co- vinylbenzyltrimethylammonium chloride), poly(n-methoxyethylacrylate -co- vinylbenzyltrimethylammonium chloride), or poly(n-ethoxyethylacrylate -co-vinylbenzyltrimethylammonium chloride).

69. The sealable ink receptive substrate of claim 64, wherein said fusible latex further comprises a coalescing agent.

70. The sealable ink receptive substrate of claim 69, wherein said coalescing agent comprises one of ethylene glycol, propylene glycol, hexylene glycol, ester of ethylene glycol, propylene glycol, hexylene glycol, 2-butoxyethanol, 2,2,4-trimethylpentane diol monoisobutyrate, diisobutyl esters of a mixture of diacids, Rhodiasolve DIB(by Rhodia Chemical), butyl cellulose, 2-(2-butoxyethoxy)ethanol, 2-butoxyethanol, TEXANOL (Eastman Chemical), diisobutyl succinate, diisobutyl glutarate, diisobutyl adipate, SER-AD FX-510 (Sasol Chemical), or SER-AD FX-511 (Sasol Chemical).